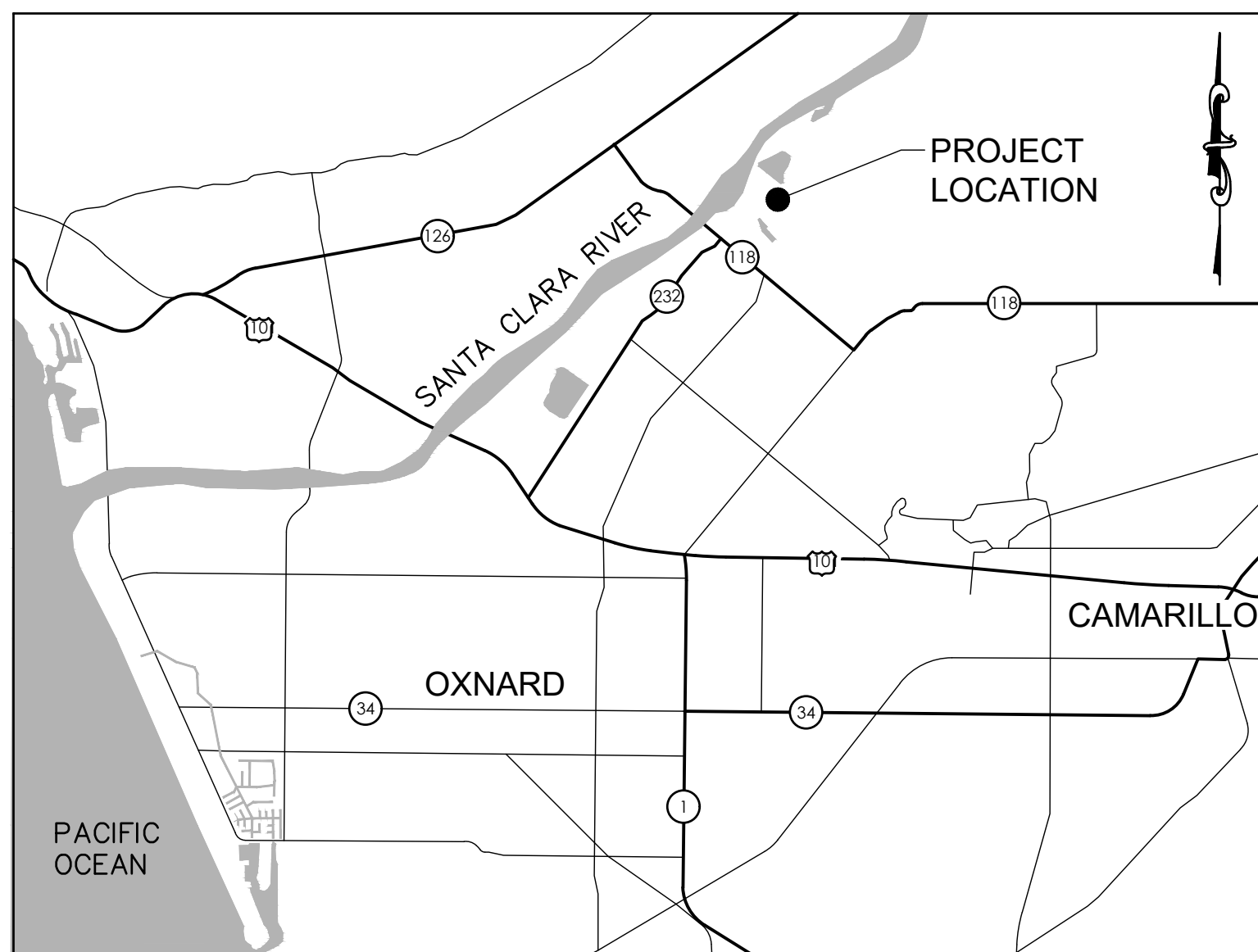


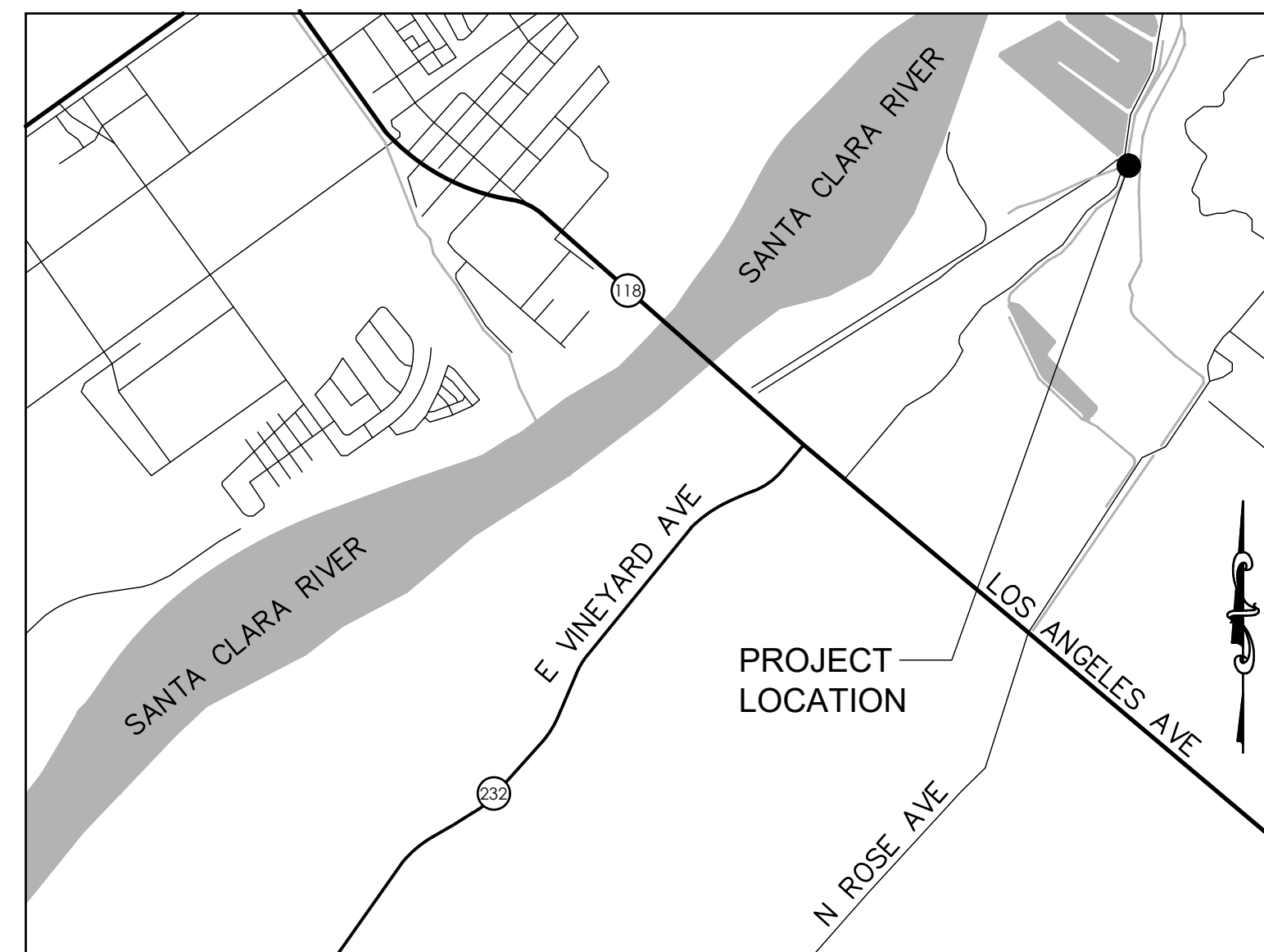
90% DESIGN DRAWINGS FOR THREE BARREL CULVERT REPLACEMENT AT THE VERN FREEMAN DIVERSION CONVEYANCE SYSTEM VENTURA COUNTY, CA



LOCATION MAP
NOT TO SCALE



AREA MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

SHEET INDEX

SHT NO.	DWG NO.	TITLE
1	G1	TITLE SHEET
2	G2	NOTES
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REFERENCES

- LOWER RIVER SYSTEM, MAIN SUPPLY LINE, CULVERT, STA 40+80.40 TO STA 41+85.40, (AS-BUILT DWG, M-100-15), PREPARED BY UNITED WATER CONSERVATION DISTRICT, REV 2, DATED 3/19/1962.
- TBC 30% DESIGN, EMAIL CORRESPONDENCE WITH "UNITED POTHOLE DRAWING 404 SEC 4A" HAND DRAWING FROM BRYCE CRUEY (NHC) TO JENNIFER ALLEN (GANNETT FLEMING), PREPARED BY NHC, DATED 9/25/2020.

PROJECT CONTACTS

OWNER

UNITED WATER CONSERVATION DISTRICT
CRAIG MORGAN
PHONE: (805) 525-4431

HYDRAULIC ENGINEER

NORTHWEST HYDRAULIC CONSULTANTS, INC.
ED WALLACE
PHONE: (626) 440-0080

ENGINEER OF RECORD

GANNETT FLEMING INC.
JENNIFER S. ALLEN
PHONE: (510) 768-0180



REV	BY	DATE	DESCRIPTION

TITLE SHEET
THREE BARREL CULVERT
VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
SANTA PAULA
VENTURA COUNTY
CALIFORNIA



DATE: 08/14/23
SCALE: AS SHOWN
DESIGNED BY: RC/SMU/WLM
DRAFTED BY: P. BARBER
CHECKED BY: JSA/TRS
JOB NO.: 067376
FILE: 067376 001.dwg

G1
SHEET 1 OF 10

90% NOT FOR CONSTRUCTION

PLOT DATE: Monday, August 14, 2023 6:33:21 PM BY: CONRAD, RYAN CTB: TAB: G1
FILE: C:\Users\Yconrad\OneDrive - Gannett Fleming Inc\504-CADD-067376-NHC-FreemanDiv\067376 001.dwg



GENERAL NOTES

- 1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. THE NOTES PROVIDED ON THESE DRAWINGS DO NOT REPRESENT A COMPLETE DESCRIPTION OF THE WORK TO BE PERFORMED AND ARE INTENDED TO COMPLEMENT THE SPECIFICATIONS AND PLANS.
A. CALTRANS 2022 STANDARD PLANS, OR MOST RECENT UPDATE:
PLAN A62E: EXCAVATION AND BACKFILL CAST-IN-PLACE REINFORCED CONCRETE BOX AND ARCH CULVERTS
PLANS A63A AND A63B: PORTABLE CONCRETE BARRIER (TYPE 60K)
PLAN BO-3: BRIDGE DETAILS
PLAN DB1: CAST-IN-PLACE REINFORCED CONCRETE DOUBLE BOX CULVERT
PLAN DB9A: PIPE CULVERT HEADWALLS STRAIGHT AND "L"
REVISED PLAN DB2: CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS
B. CALTRANS 2022 STANDARD SPECIFICATIONS, OR MOST RECENT UPDATE:
SECTION 19-3: STRUCTURE EXCAVATION AND BACKFILL
SECTION 51: CONCRETE STRUCTURES
SECTION 68-4: EDGE DRAINS
SECTION 68-7: GEOCOMPOSITE DRAIN SYSTEMS
SECTION 72-2: ROCK SLOPE PROTECTION
SECTION 72-3: CONCRETED-ROCK SLOPE PROTECTION
SECTION 83-1: GENERAL (FOR RAILINGS AND BARRIERS)
SECTION 83-3: CONCRETE BARRIERS
3. IN CASE OF CONFLICT BETWEEN THE CONSTRUCTION DOCUMENTS AND CALTRANS STANDARD SPECIFICATIONS AND PLANS, NOTIFY THE OWNER AND THE ENGINEER.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS.
5. LOCATIONS AND DIMENSIONS OF EXISTING STRUCTURES AND FEATURES HAVE NOT BEEN VERIFIED.
6. PRIOR TO THE START OF CONSTRUCTION, LOCATE ALL EXISTING AND UNDERGROUND UTILITIES IN AND AROUND THE AREAS OF NEW CONSTRUCTION.
7. NOTIFY THE OWNER AND ENGINEER WHERE A CONFLICT OR DISCREPANCY OCCURS BETWEEN THESE DRAWINGS AND ANY OTHER PORTION OF THE CONTRACT DOCUMENTS OR EXISTING FIELD CONDITIONS.
8. PRODUCTS REFERENCED IN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONSTRUCTED, INSTALLED, AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN RECOMMENDATIONS UNLESS OTHERWISE NOTED.
9. DO NOT SCALE DRAWINGS. CONTACT THE ENGINEER FOR ANY DIMENSIONS OR SPECIFIC DETAIL NOT SHOWN.
10. THE CONTRACTOR SHALL MAINTAIN RECORDS SUITABLE FOR DEVELOPING "AS-BUILT" DRAWINGS THROUGHOUT THE COURSE OF CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO, THE LOCATIONS AND GRADES OF ALL UNDERGROUND AND SURFACE IMPROVEMENTS.

DESIGN BASIS AND LOADING

- 1. THE DESIGNS DEPICTED IN THESE DRAWINGS ARE BASED ON INFORMATION PROVIDED IN THE FOLLOWING REFERENCES:
A. TOPOGRAPHIC BASE MAP, PROVIDED BY STANTEC, DATED JUNE 11, 2020.
B. PRELIMINARY GEOTECHNICAL MEMORANDUM, PROVIDED BY GANNETT FLEMING, DATED SEPTEMBER 30, 2020.
2. DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS:
A. ACI 318-19, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
B. 2019 CALIFORNIA BUILDING CODE
C. USACE ENGINEER MANUALS:
EM 1110-2-2100: STABILITY ANALYSIS OF CONCRETE STRUCTURES, DATED 12/1/2005.
EM 1110-2-2104: STRENGTH DESIGN FOR REINFORCED CONCRETE HYDRAULIC STRUCTURES, DATED 11/30/2016.
EM 1110-2-2902: CONDUITS, PIPES, AND CULVERTS ASSOCIATED WITH DAMS AND LEVEE SYSTEMS, DATED 12/31/2020.
D. AWWA MANUAL M55, PE PIPE - DESIGN AND INSTALLATION, FIRST EDITION
E. CALTRANS 2022 STANDARD PLANS AND REVISED STANDARD PLANS

GEOTECHNICAL DESIGN PARAMETERS PER GEOTECHNICAL MEMORANDUM (SEE DESIGN BASIS AND LOADING NOTE 1B).

- 4. DESIGN LOADS:
DEAD LOADS :
REINFORCED CONCRETE = 150 PCF
PORTABLE CONCRETE BARRIER = 900 PLF
STAINLESS STEEL SLIDE GATE SYSTEM =10,000 POUNDS
LIVE LOADS :
VEHICLE TRAFFIC SURCHARGE = 250 PSF
LATERAL EARTH PRESSURES :
SOIL UNIT WEIGHT = 120 PCF

- 5. SEISMIC DESIGN PARAMETERS:
SDS = 1.292g
PEAK GROUND ACCELERATION = 0.943g
SITE CLASS = D (STIFF SOIL)
RISK CATEGORY = II

6. STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURES ONLY. PROTECT AND STABILIZE STRUCTURES AS NECESSARY DURING CONSTRUCTION AND UNTIL DESIGN STRENGTHS ARE ACHIEVED.

SURVEY

- 1. HORIZONTAL COORDINATE SYSTEM: NAD83 CALIFORNIA STATE PLANE, ZONE 5.
2. VERTICAL DATUM: NGVD29.
3. ALL UNITS SHOWN IN ARE IN U.S. SURVEY FEET.
4. CONTRACTOR TO PROVIDE FIELD SURVEYING FOR PROJECT LAYOUT AND CONTROL.
5. AERIAL PHOTOGRAPHS ARE FROM GOOGLE EARTH AND ARE SOLELY FOR ILLUSTRATIVE PURPOSES. IMAGERY REFERENCES PROVIDED ON RELEVANT SHEETS.

DEWATERING

- 1. THE CANAL SYSTEM IN THE PROJECT VICINITY WILL BE DEWATERED BY THE OWNER FOR THE DURATION OF THE WORK.
2. GROUNDWATER AND/OR SURFACE WATER MAY BE ENCOUNTERED DURING EXCAVATION AND SUBGRADE PREPARATION. THE CONTRACTOR IS RESPONSIBLE FOR DEWATERING AS NECESSARY TO MAINTAIN STABLE AND CLEAN EXCAVATIONS. DIRECT DISCHARGE OF AFOREMENTIONED GROUNDWATER/SURFACE WATER INTO STREAMBED IS NOT PERMISSIBLE. FINAL DISCHARGE POINTS FOR ALL DEWATERING SHALL BE APPROVED BY UNITED WATER CONSERVATION DISTRICT.
3. ALL PERMANENT IMPROVEMENTS SHALL BE CONSTRUCTED IN THE DRY.
4. CONTRACTOR SHALL PROVIDE A DEWATERING PLAN PRIOR TO CONSTRUCTION FOR REVIEW AND APPROVAL BY THE ENGINEER.

EXCAVATION

- 1. NOTIFY UNDERGROUND SERVICE ALERT (USA SOUTH) TO IDENTIFY THE LOCATION OF EXISTING UTILITIES AT LEAST TWO WORKING DAYS PRIOR TO ANY EXCAVATION WORK: (800)-422-4133 OR WWW.DIGALERT.ORG.
2. LOCATIONS AND LAYOUTS OF EXISTING UTILITIES, BOTH ACTIVE AND ABANDONED, ARE BASED ON PROVIDED TOPOGRAPHY AND REFERENCES ON SHEET G1. FIELD VERIFICATION IS REQUIRED PRIOR TO PROJECT CONSTRUCTION.
3. THE CONTRACTOR IS RESPONSIBLE FOR STABILITY AND SHORING OF TEMPORARY CUT SLOPES AND TRENCHES, AND SHALL CONFORM TO THE REQUIREMENTS OF CAL-OSHA.
4. EXCAVATIONS SHALL BE KEPT CLEAN AND DRY.

DEMOLITION

- 1. PROTECT EXISTING FEATURES THAT ARE TO REMAIN IN PLACE FROM DAMAGE UNLESS OTHERWISE NOTED.

FOUNDATION

- 1. CONTRACTOR SHALL BE PREPARED FOR POSSIBLE GRAVEL, COBBLES AND/OR ROCKFILL SUBGRADE CONDITIONS.
2. THE SUBGRADE SURFACE SHALL COMPRISE FIRM, NON-YIELDING MATERIALS. SHOULD OVER-EXCAVATION BE NEEDED TO REACH FIRM MATERIAL, BACKFILL SUBGRADE UP TO DESIGN GRADE

EARTHWORK

- 1. REFER TO CALTRANS 2022 STANDARD PLAN A62E FOR EARTHWORK RELATED TO THE CULVERTS. UNLESS OTHERWISE NOTED, ALL EARTHWORK SHALL ADHERE TO SECTION 19-3 OF THE CALTRANS 2022 STANDARD SPECIFICATIONS.
2. PREPARE DESIGNATED FILL AREAS BY GRUBBING AND STRIPPING VEGETATION, REMOVING DEBRIS, AND SCARIFYING TO A MINIMUM DEPTH OF 8 INCHES PRIOR TO MATERIAL PLACEMENT.
3. UNLESS OTHERWISE NOTED, COMPACT FILL MATERIAL IN 8-INCH LOOSE LIFTS AND COMPACT TO AT LEAST 95% RELATIVE COMPACTION (RC) AT A MOISTURE CONTENT AT LEAST 2% OVER OPTIMUM PER ASTM D1557 AND D6938.
4. ONSITE FILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL (LESS THAN 3% BY VOLUME) AND SHOULD NOT CONTAIN ANY PARTICLES GREATER THAN 3" IN DIAMETER.
5. IMPORTED FILL MATERIAL SHALL BE FREE OF ORGANICS (LESS THAN 3% BY VOLUME), DEBRIS, HAVE AT LEAST 20% FINES AND NO PARTICLES GREATER THAN 3" IN DIAMETER PER ASTM D6913, AND HAVE A PLASTICITY INDEX OF 12 OR LESS PER ASTM D4318.
6. PERFORM GRADING TO THE LINES AND GRADES SHOWN. FINISHED SURFACES SHALL PROVIDE POSITIVE SURFACE DRAINAGE TO PREVENT PONDING.
7. SEE HDPE PIPE NOTES, THIS SHEET.

TEMPORARY ENVIRONMENTAL/EROSION CONTROL

- 1. CONTAIN SURFACE RUNOFF AND CEMENTITIOUS MATERIAL DURING CONSTRUCTION TO PREVENT CONTAMINATION OF GROUND AND SURFACE WATERS.
2. MAINTAIN THE SITE AND ADJACENT PROPERTY IN A CLEAN, SAFE, AND USABLE CONDITION. ALL SPOILS OF SOIL, ROCK, OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED.
3. IMPLEMENT EROSION AND SEDIMENT CONTROL PLANS AND BEST MANAGEMENT PRACTICES AS REQUIRED BY LOCAL AND STATE JURISDICTIONS.

DRAINAGE

- 1. WEEP HOLES, OR DRAINAGE PIPES, SHALL BE PER BRIDGE DETAIL 3-1 OF PLAN BO-3 OF THE CALTRANS 2022 STANDARD PLANS, OAE.
2. DRAINAGE PIPES AND FILTER FABRIC SHALL COMPLY WITH SECTION 68-7 OF THE CALTRANS 2022 STANDARD SPECIFICATIONS. DRAINAGE PIPES SHALL ALSO COMPLY WITH SECTION 68-4.02B OF THE CALTRANS 2022 STANDARD SPECIFICATIONS.
3. PERVIOUS BACKFILL MATERIAL SHALL COMPLY WITH SECTION 19-3.02D OF THE CALTRANS 2022 STANDARD SPECIFICATIONS FOR GRAVEL OR CRUSHED GRAVEL.
4. TERMINATE PERVIOUS BACKFILL BEHIND WINGWALLS WHEN 3'-0" DEPTH IS UNABLE TO BE MET PER BRIDGE DETAIL 3-1 OF PLAN BO-3 OF THE CALTRANS 2022 STANDARD PLANS.

CONCRETE

- 1. UNLESS OTHERWISE NOTED, ALL CONCRETE STRUCTURES SHALL BE CAST-IN-PLACE.
2. CONCRETE STRENGTH AND MIX REQUIREMENTS:
MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) = 4,500 PSI
WATER/CEMENT RATIO = 0.45 (±.03)
MAXIMUM AGGREGATE SIZE = 1"
AIR ENTRAINMENT = 4.5% MIN (SEE ACI 318-19 TABLE 19.3.3.1 FOR SMALLER AGGREGATE SIZE REQUIREMENTS)
CEMENT = ASTM C150 TYPE II
EXPOSURE CLASSES:
FREEZING AND THAWING = F0
SULFATE = S0
PERMEABILITY = W2
CORROSION = C1

- 3. FORMS SHALL BE PROVIDED TO ACHIEVE LINES, GRADES, AND GEOMETRY OF CONCRETE STRUCTURES AS INDICATED ON THESE DRAWINGS.
4. EXPOSED CONCRETE EDGES SHALL HAVE A 3/4" CHAMFER.
5. CONCRETE SURFACES SHALL BE CLASS 1 SURFACE FINISH FOR ALL HEADWALLS AND WINGWALLS PER CALTRANS 2022 STANDARD SPECIFICATION SECTION 51-1.03F(3).
6. REINFORCING STEEL:
DEFORMED REBAR = ASTM A615, GRADE 60 (fy = 60 KSI)
7. REINFORCEMENT SPACING SHOWN IS CENTER TO CENTER OF BARS. REINFORCEMENT FOR CULVERTS AND DRAINAGE/FLOOD DITCH HEADWALL NOT SHOWN FOR CLARITY IN SECTIONS AND DETAILS.
8. UNLESS OTHERWISE NOTED, MAINTAIN 3" OF COVERAGE TO THE FACE OF REBAR.
9. MINIMUM LAP LENGTHS SHALL CONFORM TO TABLE 1, THIS SHEET.
10. STEEL SHALL BE KEPT CLEAN AND FREE OF RUST SCALES.
11. REINFORCING BARS SHALL BE PLACED IN LENGTHS AS LONG AS POSSIBLE. ALL REINFORCING STEEL SHALL BE COLD BENT.
12. REINFORCING AND INSERTS SHALL BE RIGIDLY HELD IN PLACE PRIOR TO CONCRETE PLACEMENT.
13. INSPECTION AND TESTING REQUIREMENTS FOR FIRST BATCH PRODUCED EACH DAY SHALL MEET THE FOLLOWING:
TEMPERATURE PER ASTM C172
AIR CONTENT PER ASTM C231
SLUMP PER ASTM C143
CONCRETE COMPRESSIVE STRENGTH PER CALIFORNIA TEST 529 & 533 FOR FIVE TEST CYLINDERS PER EVERY 300 CUBIC YARDS (1 AT 7 DAYS, 1 AT 14 DAYS, 2 AT 28 DAYS, AND ONE HOLD)

ROCK SLOPE PROTECTION

- 1. RSP SHALL BE CONCRETED AND COMPLY WITH THE ROCK GRADING AND FABRIC REQUIREMENTS SHOWN IN SECTION 72-3.02C OF THE CALTRANS 2022 STANDARD SPECIFICATIONS FOR CLASS III ROCK.
2. RSP SHALL CONFORM TO THE REQUIREMENTS OF CALTRANS METHOD B PLACEMENT PER SECTION 72-3.03C OF THE CALTRANS 2022 STANDARD SPECIFICATIONS.
3. ROCK AND CONCRETE MATERIAL MUST MEET THE REQUIREMENTS IN SECTION 72-3.02 OF THE CALTRANS 2022 STANDARD SPECIFICATIONS FOR CLASS III ROCK.
4. RSP SHALL BE TESTED AND IN ACCORDANCE WITH SECTION 72-3 OF THE 2022 CALTRANS STANDARD SPECIFICATIONS FOR CLASS III ROCK.
5. ROCK SHALL BE ANGULAR. ROUNDED ROCK AND COBBLES ARE NOT ACCEPTABLE.
6. CONCRETE SHALL HAVE A SLUMP OF 3 TO 4 INCHES
7. MINIMUM RSP LAYER THICKNESS = 2'-0".
8. THE AREA COVERED WITH RSP SHALL BE CLEARED OF LOOSE SOIL AND DEBRIS. ALL EXCESS EXCAVATED MATERIAL SHALL BE DISPOSED OF IN UNITED WATER CONSERVATION DISTRICT'S DESIGNATED AREAS NEAR THE SITE OR OFF-HAULED TO AN ACCEPTABLE WASTE DISPOSAL FACILITY AS DETERMINED BY UNITED WATER CONSERVATION DISTRICT.

HDPE PIPE

- 1. PIPE MATERIAL = SOLID HIGH DENSITY POLYETHYLENE (HDPE) PIPE, SDR 17, WITH SMOOTH INTERIOR AND EXTERIOR SURFACES.
2. HDPE PIPE SHALL BE DESIGNED, MANUFACTURED, AND INSTALLED PER GUIDELINES IN AWWA M55. PIPE SHALL BE IN ACCORDANCE WITH THE DESIGN WINDOW OF AWWA M55 CHAPTER 5.
3. PIPE SHALL BE PRODUCED PER AWWA M55 CHAPTER 1, IN ACCORDANCE WITH ANSI/AWWA C906, MEETING REQUIREMENTS IN ASTM D3350.
4. PIPE SHALL BE INSTALLED PER AWWA M55 CHAPTER 8, IN ACCORDANCE WITH ANSI/AWWA C906, MEETING REQUIREMENTS IN ASTM D2321. IN ADDITION TO ASTM D2321, OVERSIGHT OF PIPE INSTALLATION SHALL ADHERE TO SECTIONS 5.8 AND 5.9 OF USACE EM 1110-2-2902.
5. PIPE SIZING SHALL CONFORM TO AWWA M55 CHAPTER 3, TABLE 3-1, FOR A 30" OD.
6. PIPE SEGMENTS SHALL BE BUTT FUSION WELDED PER AWWA M55 CHAPTER 6, IN ACCORDANCE WITH ANSI/AWWA C906, MEETING REQUIREMENTS IN ASTM F2620 (ASTM D2657 SPECIFIES ASTM F2620 FOR HDPE PIPES).
7. INSTALL PIPE TO THE LINES AND GRADES SHOWN ON CIVIL SHEETS. COLD BEND THE PIPE WHERE NECESSARY:
MINIMUM BEND RADIUS = 67.5 FEET, OR PER MANUFACTURER RECOMMENDATIONS
8. MINIMUM SOIL COVER OVER PIPE = 3 FEET
9. CONNECTION OF PIPE AND CONC HEADWALLS SHALL COMPRISE A RUBBER MANHOLE STOP RING, MANUFACTURED BY NORTHTOWN PIPE PROTECTION PRODUCTS, OAE, AND SHALL MEET REQUIREMENTS IN ASTM C923. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
10. CULVERT INSTALLATION MUST BE COMPLETED PRIOR TO HDPE PIPE INSTALLATION. CULVERT INSTALLATION SHALL FOLLOW CALTRANS STANDARD PLAN A62E. HDPE PIPE INSTALLATION SHALL FOLLOW THE TRENCHING METHOD PER AWWA M55 CHAPTER 8.

- 11. CLSM SHALL BE USED AS STRUCTURAL BACKFILL AROUND THE HDPE PIPES, AS FOLLOWS:
CLSM PROPERTIES SHALL ADHERE TO SECTION 5.5.18.1, INCLUDING TABLE 5-2, OF USACE EM 1110-2-2902.
CLSM SHALL BE USED FOR BEDDING AND INITIAL BACKFILL AROUND THE HDPE PIPES, PER AWWA M55 CHAPTER 8, PRIOR TO FINAL BACKFILL. CLSM SHALL BE PLACED A MINIMUM OF 12 INCHES ABOVE THE PIPE CROWN AND TO THE SIDES OF THE PIPE SPRINGLINE. TEMPORARY FORMWORK OR A WEIGHTED ANCHOR SYSTEM, PER SECTION 5.5.18.1 OF USACE EM 1110-2-2902, OAE, SHALL BE USED DURING CLSM BACKFILL AROUND THE PIPES TO PREVENT FLOTATION AND UNTIL BACKFILL ABOVE THE CULVERT CAN BE COMPLETED.
THE ROOF OF THE CULVERT MUST BE CAST AND FULLY CURED TO SERVE AS THE FOUNDATION OF THE HDPE PIPES AND CLSM BACKFILL PRIOR TO PIPE INSTALLATION.

INSPECTION AND OBSERVATION

- 1. CONTRACTOR SHALL PROVIDE QUALITY CONTROL, MATERIALS TESTING AND SPECIAL INSPECTION RELATED TO THE PROPOSED WORK. CONTRACTOR SHALL PERFORM AND/OR RETAIN THE SERVICES OF A CERTIFIED TESTING LABORATORY TO PERFORM ALL QUALITY CONTROL TESTS OF THE PROPOSED WORK. ONLY THE CERTIFIED TESTS BY THE TESTING LABORATORY CAN BE USED TO VERIFY COMPLIANCE TO THE PROJECT DOCUMENTS.
2. CONSTRUCTION OBSERVATION BY THE INSPECTOR, APPROVED BY THE OWNER, IS REQUIRED AT THE FOLLOWING STAGES OF CONSTRUCTION:
SITE LAYOUT
COMPLETION OF EXCAVATION/APPROVAL OF FOUNDATION (ENGINEER HOLD POINT)
PLACEMENT OF FORM WORK
PLACEMENT OF REINFORCING STEEL (ENGINEER HOLD POINT)
PLACEMENT OF CONCRETE
PLACEMENT OF SLIDE GATE
INSTALLATION OF HDPE PIPES
PLACEMENT AND COMPACTION OF FILL MATERIALS (ENGINEER HOLD POINT)
3. NOTIFY THE INSPECTOR/ENGINEER AT LEAST 48 HOURS BEFORE INSPECTION OR OBSERVATION IS NEEDED.
4. CONTRACTOR SHALL SUBMIT PROPOSED MATERIALS AND PRODUCTS CALLED FOR IN THE PLANS FOR REVIEW AND APPROVAL OF THE ENGINEER: DEWATERING PLAN, CONCRETE, REINFORCING STEEL, RSP, IMPORTED BACKFILL, PERVIOUS BACKFILL, CLSM, HDPE PIPES, SLIDE GATE ANCHOR BOLTS, ETC.

Table with 6 columns: BAR SIZE, DEV LENGTH (IN), CLASS B LAP SPLICE (IN), DEV LENGTH (IN), CLASS B LAP SPLICE (IN), DEV LENGTH Ldh (IN). Rows #4 through #9.

FOOTNOTES:

- A. BASED ON ACI 318-19 SECTIONS 25.4.2 - 25.4.3, WITH f'c = 4,500 PSI AND fy = 60,000 PSI. STD HOOK DIAMETERS AND EXTENSIONS FOLLOW STD DETAILS FROM CONCRETE REINFORCING STEEL INSTITUTE (CRSI).
B. TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BAR PLACED SUCH THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

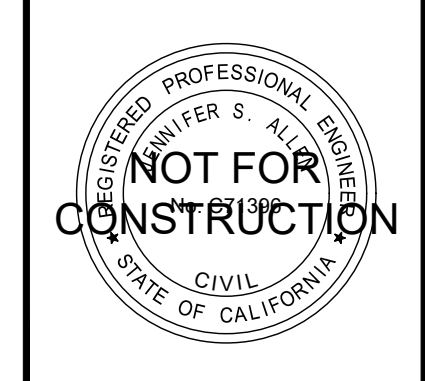
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Table with 4 columns: REV, BY, DATE, DESCRIPTION. Multiple empty rows.

NOTES
THREE BARREL CULVERT
VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
SANTA PAULA
VENTURA COUNTY
CALIFORNIA



DATE: 08/14/23
SCALE: AS SHOWN
DESIGNED BY: RC/SMU/WLM
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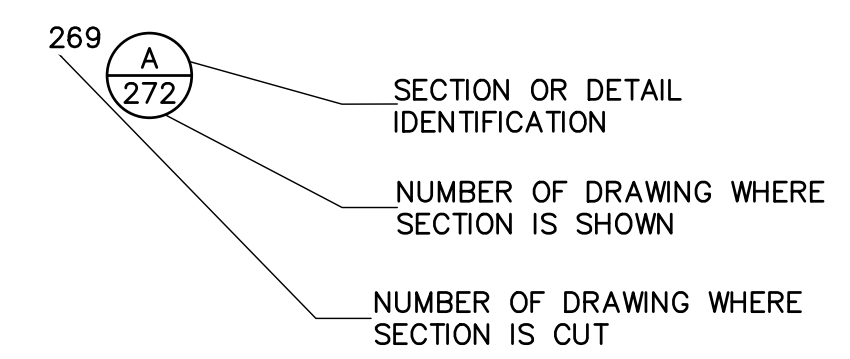
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LEGEND & ABBREVIATIONS

(E) — 3500 —	MAJOR CONTOUR
(E) — 3500 —	MINOR CONTOUR
(N) — 3500 —	MAJOR CONTOUR
(N) — 3500 —	MINOR CONTOUR
APPROX	APPROXIMATE
BOF	BOTTOM OF FOOTING
BOW	BOTTOM OF WALL
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT
¢	CENTER LINE
CLR	CLEAR
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CONC	CONCRETE, CONCRETED
D/S	DOWNSTREAM
DIA, Ø	DIAMETER OR PIPE DIAMETER
DEMO	DEMOLISH
DWG	DRAWING
(E)	EXISTING FEATURE
EF	EACH FACE
EG	EXISTING GRADE
ELEC	ELECTRIC
ELEV	ELEVATION
FG	FINISH GRADE
FTG	FOOTING
FV	FIELD VERIFY
G	GAS LINE
GM	GAS METER
GV	GAS VALVE
HORIZ	HORIZONTAL
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
INV	INVERT
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
(N)	NEW FEATURE
OAE	OR APPROVED EQUIVALENT
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHW	OVERHEAD WIRES
PIP	PROTECT-IN-PLACE
RC	RELATIVE COMPACTION
RCB	REINFORCED CONCRETE BOX
REINF	REINFORCEMENT
RSP	ROCK SLOPE PROTECTION
S	SLOPE
SCH	SCHEDULE
SDR	STANDARD DIMENSION RATIO
SPEC	SPECIFICATION
SS	STAINLESS STEEL
STD	STANDARD
TOT	TOTAL
TOW	TOP OF WALL
TYP	TYPICAL
U/S	UPSTREAM
W	WATER LINE
WV	WATER VALVE
	FLOW PATH
	CONTROL POINT
	COORDINATE POINT
	DEMOLITION



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REV	BY	DATE	DESCRIPTION

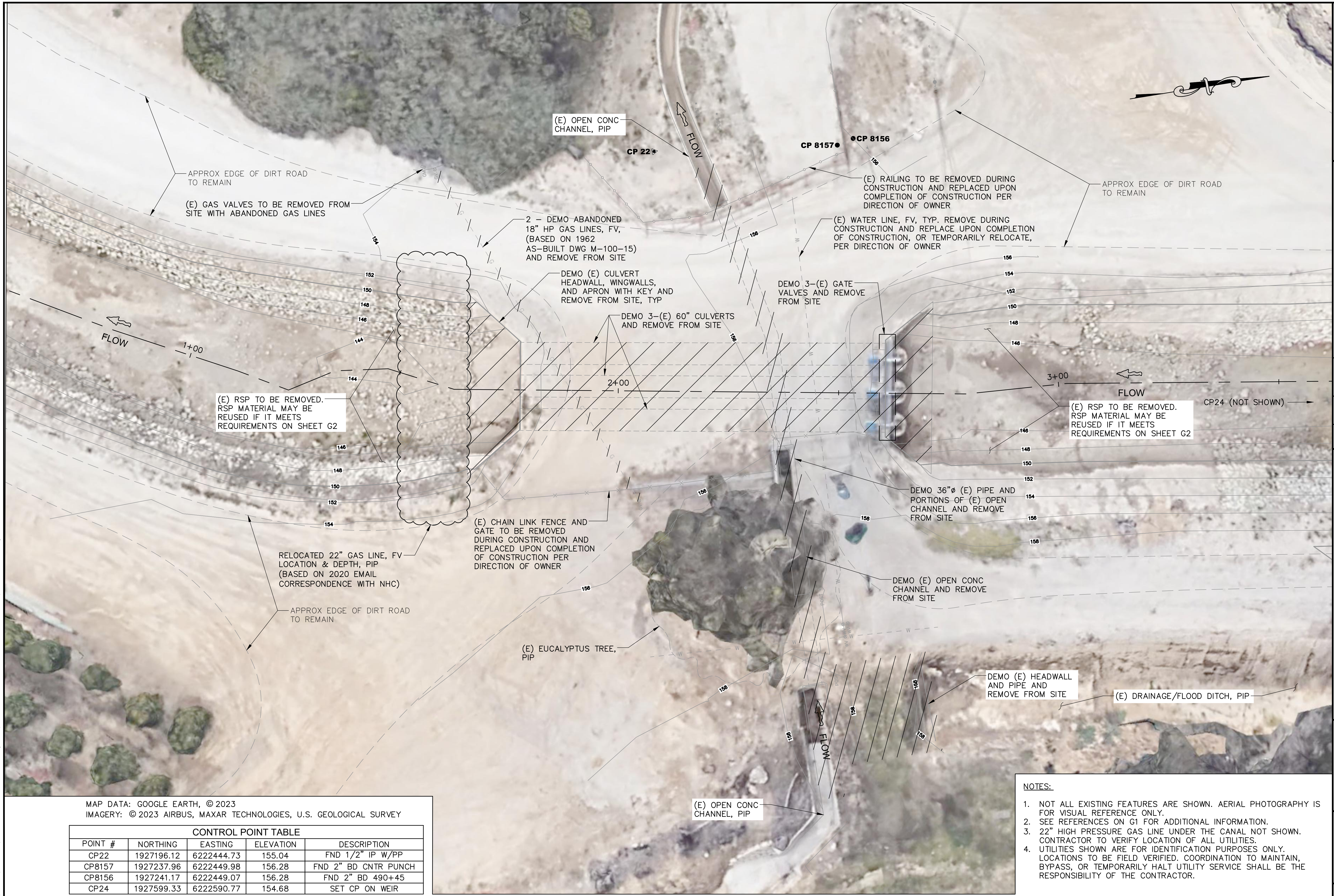
ABBREVIATIONS
 THREE BARREL CULVERT
 VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
 SANTA PAULA VENTURA COUNTY CALIFORNIA



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 IMAGERY: © 2023 AIRBUS, MAXAR TECHNOLOGIES, U.S. GEOLOGICAL SURVEY

CONTROL POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP22	1927196.12	6222444.73	155.04	FND 1/2" IP W/PP
CP8157	1927237.96	6222449.98	156.28	FND 2" BD CNTR PUNCH
CP8156	1927241.17	6222449.07	156.28	FND 2" BD 490+45
CP24	1927599.33	6222590.77	154.68	SET CP ON WEIR

PLAN
 SCALE: 1" = 10'

NOTES:

1. NOT ALL EXISTING FEATURES ARE SHOWN. AERIAL PHOTOGRAPHY IS FOR VISUAL REFERENCE ONLY.
2. SEE REFERENCES ON G1 FOR ADDITIONAL INFORMATION.
3. 22" HIGH PRESSURE GAS LINE UNDER THE CANAL NOT SHOWN. CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES.
4. UTILITIES SHOWN ARE FOR IDENTIFICATION PURPOSES ONLY. LOCATIONS TO BE FIELD VERIFIED. COORDINATION TO MAINTAIN, BYPASS, OR TEMPORARILY HALT UTILITY SERVICE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

GANNETT FLEMING
 2251 Douglas Blvd., Ste. 200
 Roseville, CA 95661
 (916) 677-4800
 www.GANNETFLEMING.com

REV	BY	DATE	DESCRIPTION

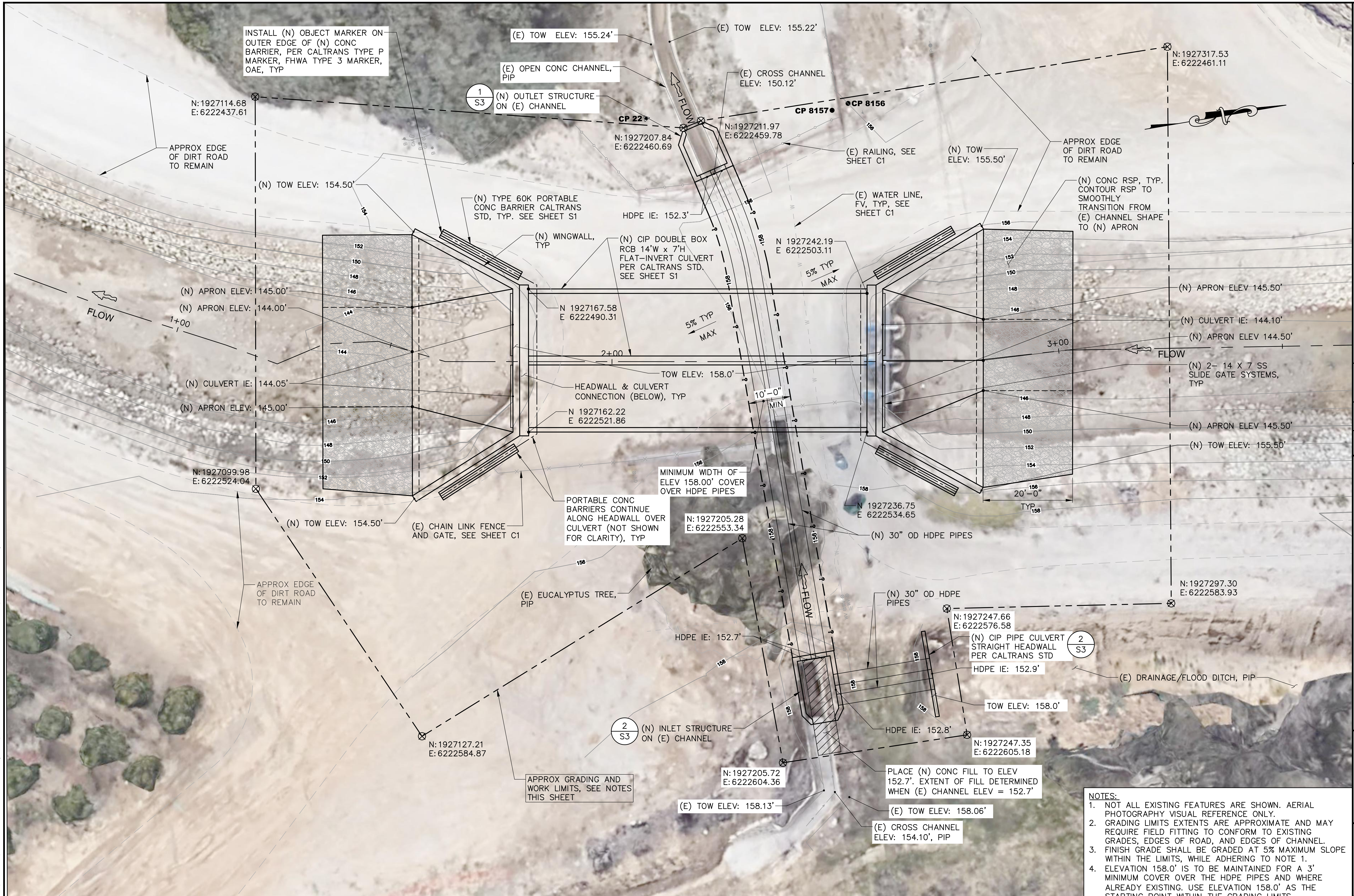
DEMOLITION PLAN
 THREE BARREL CULVERT
 VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
 SANTA PAULA
 VENTURA COUNTY
 CALIFORNIA



DATE: 08/14/23
 SCALE: AS SHOWN
 DESIGNED BY: RC/SMU/WLM
 DRAFTED BY: P. BARBER
 CHECKED BY: JSA/TRS
 JOB NO.: 067376
 FILE: 067376 003.dwg

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PLOT DATE: Monday, August 14, 2023 TIME: 6:33:44 PM BY: CONRAD, RYAN CTB: SAGE.CTB TAB: C2
 FILE: C:\Users\Yconrad\OneDrive - Gannett Fleming Inc\504-CADD-CADD-067376-NHC-FreemanDiv\067376_004.dwg



MAP DATA: GOOGLE EARTH, © 2023
 IMAGERY: © 2023 AIRBUS, MAXAR TECHNOLOGIES, U.S. GEOLOGICAL SURVEY

PLAN
 SCALE: 1" = 10'

- NOTES:**
1. NOT ALL EXISTING FEATURES ARE SHOWN. AERIAL PHOTOGRAPHY VISUAL REFERENCE ONLY.
 2. GRADING LIMITS EXTENTS ARE APPROXIMATE AND MAY REQUIRE FIELD FITTING TO CONFORM TO EXISTING GRADES, EDGES OF ROAD, AND EDGES OF CHANNEL.
 3. FINISH GRADE SHALL BE GRADED AT 5% MAXIMUM SLOPE WITHIN THE LIMITS, WHILE ADHERING TO NOTE 1.
 4. ELEVATION 158.0' IS TO BE MAINTAINED FOR A 3' MINIMUM COVER OVER THE HDPE PIPES AND WHERE ALREADY EXISTING. USE ELEVATION 158.0' AS THE STARTING POINT WITHIN THE GRADING LIMITS.

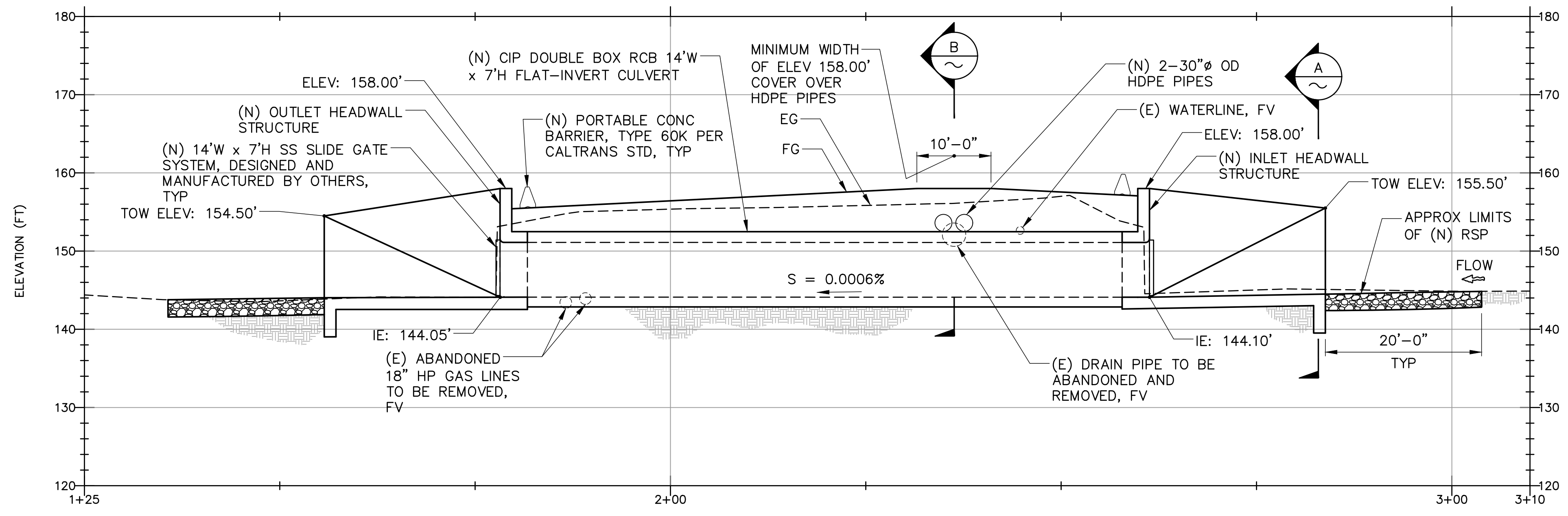
REV	BY	DATE	DESCRIPTION

NEW CULVERT PLAN
 THREE BARREL CULVERT
 VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
 SANTA PAULA
 VENTURA COUNTY
 CALIFORNIA

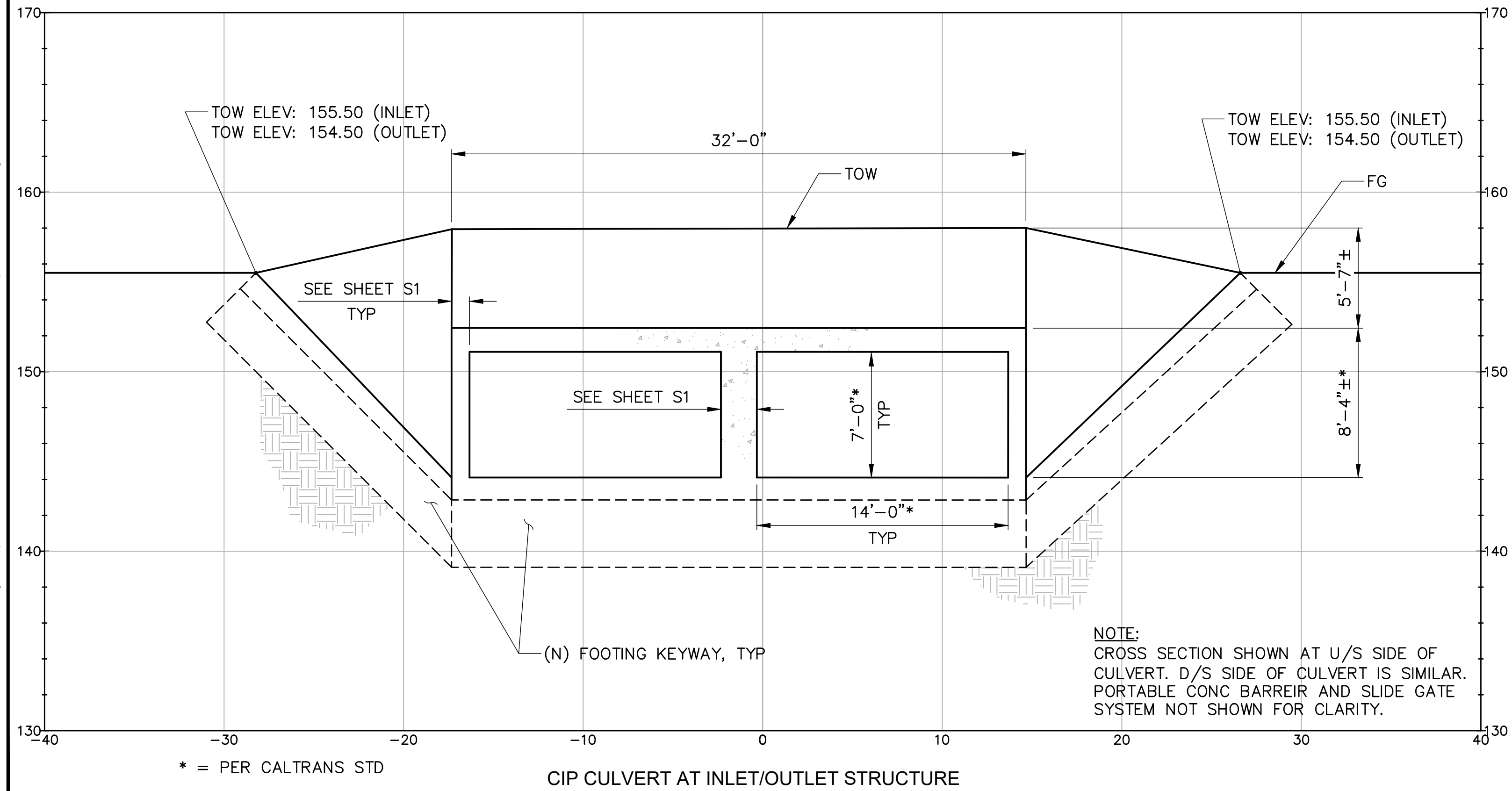


DATE: 08/14/23
 SCALE: AS SHOWN
 DESIGNED BY: RC/SMU/WLM
 DRAFTED BY: P. BARBER
 CHECKED BY: JSA/TRS
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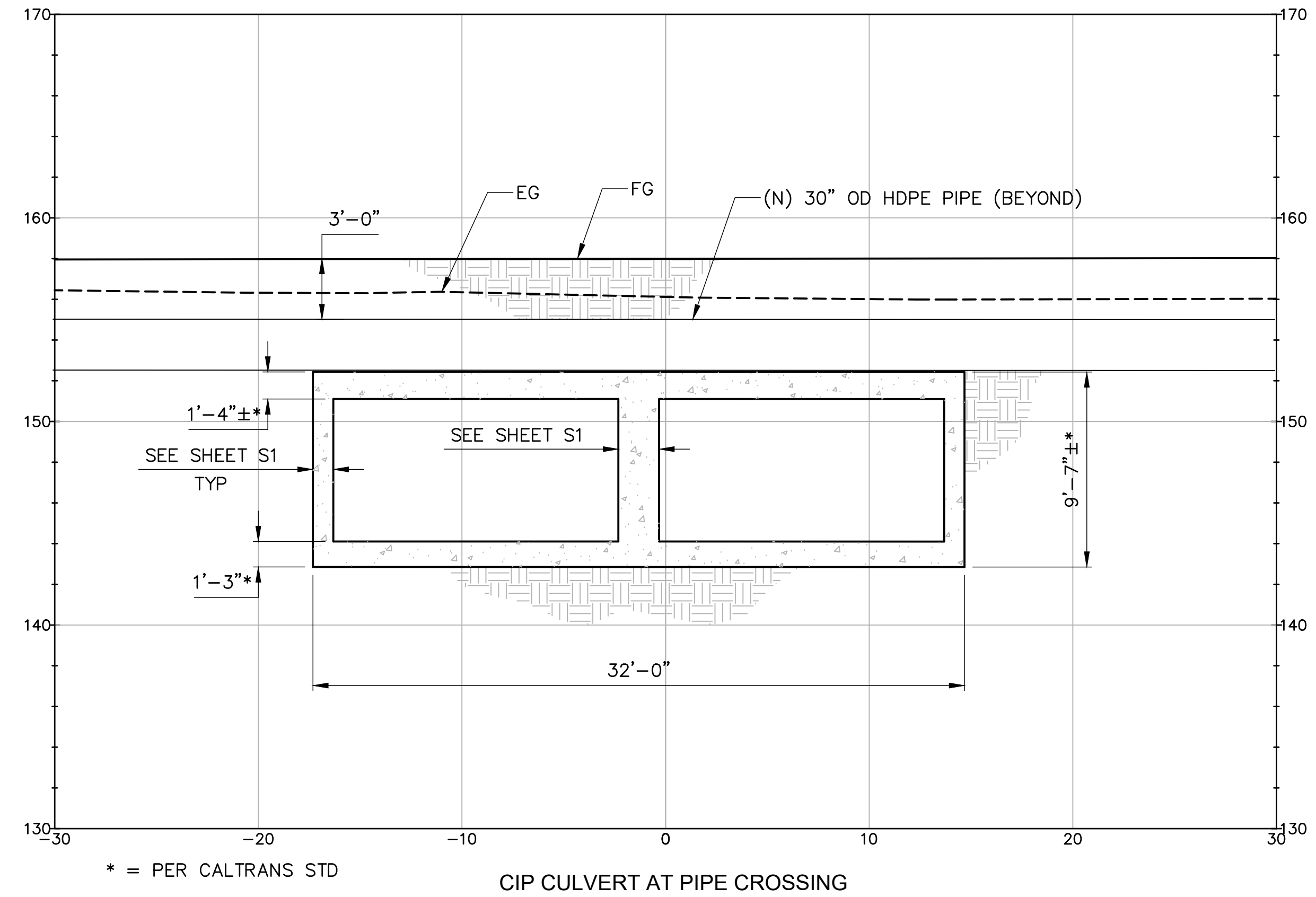
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PROFILE
 SCALE: 1" = 10'



A SECTION
 SCALE: 1" = 5'



B SECTION
 SCALE: 1" = 5'

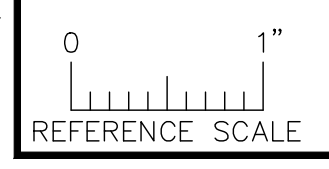
REV	BY	DATE	DESCRIPTION

NEW CULVERT PROFILE & SECTIONS
THREE BARREL CULVERT
VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
 SANTA PAULA VENTURA COUNTY CALIFORNIA



DATE: 08/14/23
 SCALE: AS SHOWN
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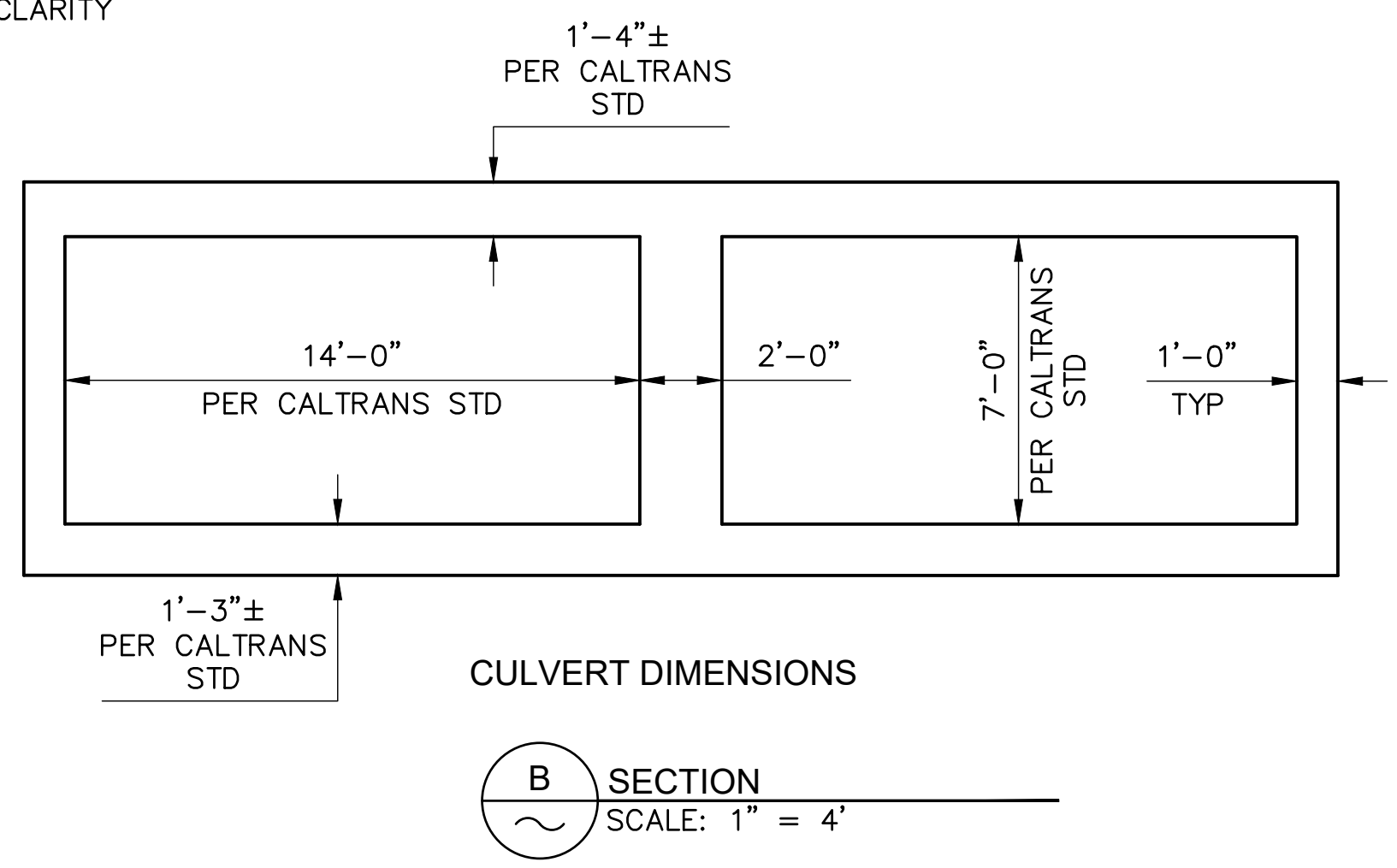
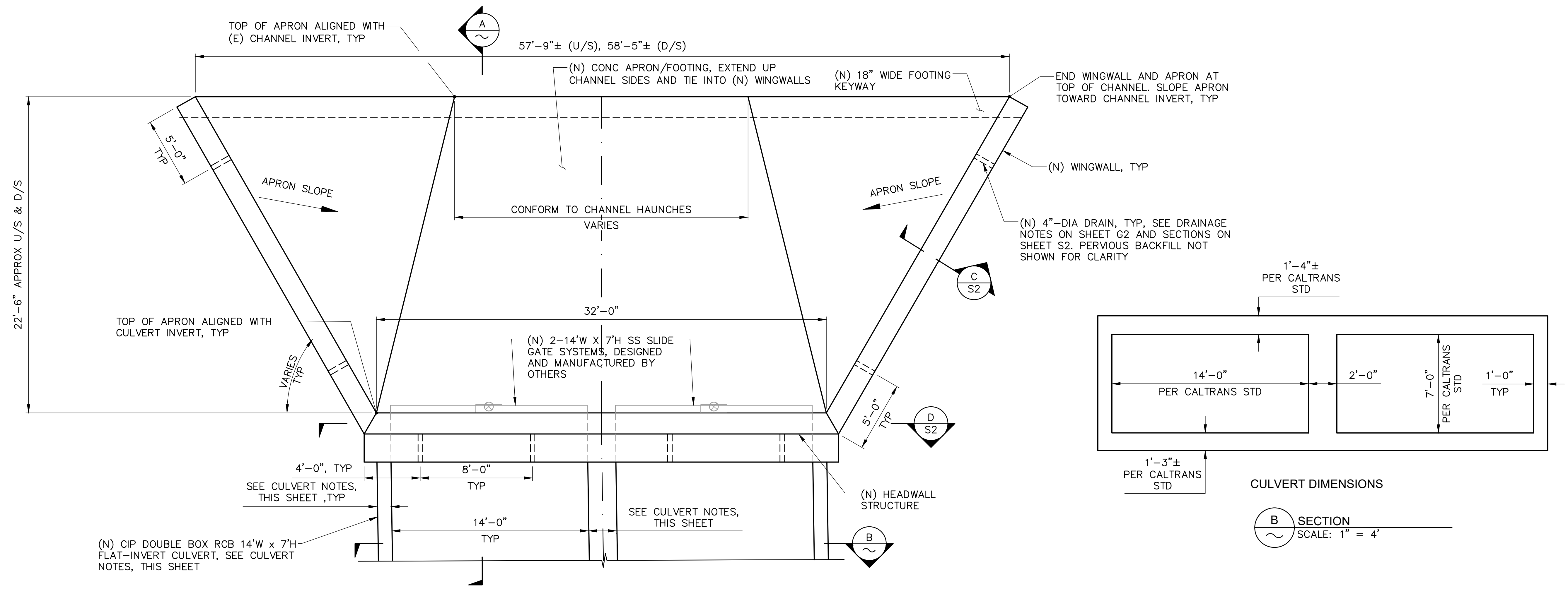
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REV	BY	DATE	DESCRIPTION

PARTIAL PLAN & SECTION
 THREE BARREL CULVERT
 VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
 SANTA PAULA VENTURA COUNTY CALIFORNIA

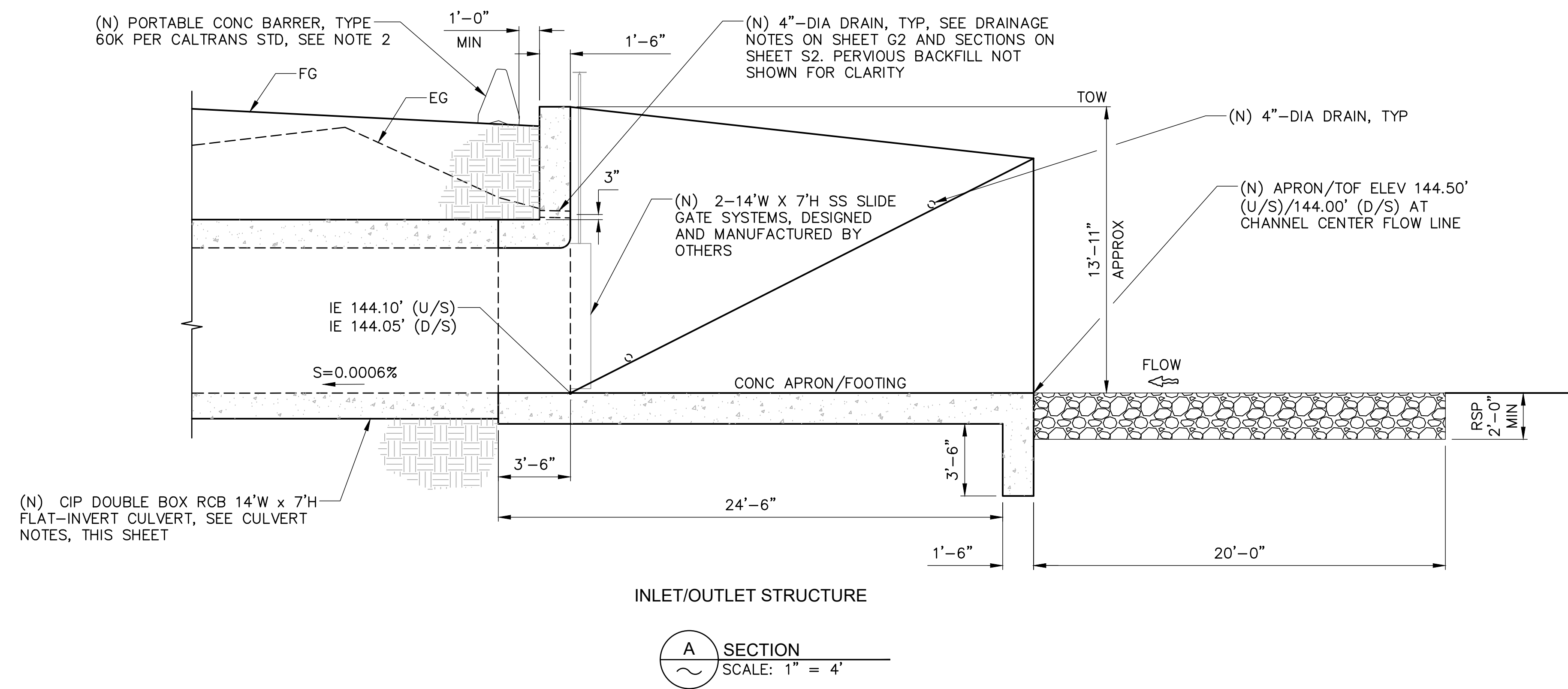


DATE: 08/14/23
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 DRAFTED BY: P. BARBER
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 JOB NO.: 067376
 FILE: 067376 007.dwg

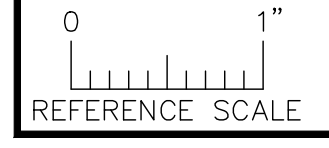


- CULVERT NOTES:**
- CIP DOUBLE BOX RCB FLAT-INVERT CULVERT SHALL BE PER CALTRANS STD PLAN D81 AND REVISED D82, OAE, EXCEPT AS NOTED BELOW.
 - INSTALL CULVERT PER CALTRANS STD SPECIFICATION SECTION 51, OAE.
 - WALL THICKNESSES ARE INCREASED FROM THE CALTRANS STD PLANS TO ACCOMMODATE SLIDE GATE SYSTEM ANCHOR BOLTS:
 - CENTER/INNER WALL THICKNESS IS 24", WITH CENTERLINE OF WALL TO EDGE OF WALL BEING 12" THICK INSTEAD OF 4". "Bm" DIMENSION FROM STD PLAN D81 SHALL BE 7'-4" INSTEAD OF 6'-8".
 - OUTER WALL THICKNESS (T2) IS 12" INSTEAD OF 10". "B" DIMENSION FROM STD PLAN D81 SHALL BE 5'-6" INSTEAD OF 5'-4".
 - TO ACCOMMODATE USACE REQUIREMENTS FOR TEMPERATURE AND SHRINKAGE REINF (PER EM 1110-2-2104, SECTION 2.9), THE FOLLOWING CULVERT REINF NEEDS TO BE MODIFIED FROM CALTRANS STD PLAN D81:
 - FOR THE CENTER/INNER WALL, REINF SHALL BE #6 INSTEAD OF #4, INCLUDING FOR "h" BARS. SPACING SHALL REMAIN THE SAME.
 - FOR THE OUTER WALLS, THE #4 @ 12" MAX REINF SHALL BE #5 @ 12".
 - FOR THE ROOF, THE #4 @ 12" MAX REINF SHALL BE #5 @ 12". THE "i" BARS SHALL BE #5 INSTEAD OF #4 WITH THE QUANTITY REMAINING THE SAME.
 - FOR THE INVERT, THE #4 @ 12" MAX REINF SHALL BE #5 @ 12".
 - ALL CULVERT REINF SHALL HAVE 3" COVER.

- NOTES:**
- PARTIAL PLAN AND CROSS SECTION SHOWN AT U/S SIDE OF CULVERT. D/S SIDE OF CULVERT IS SIMILAR. REINF NOT SHOWN FOR CLARITY.
 - PORTABLE CONCRETE BARRIER NOT SHOWN IN PARTIAL PLAN FOR CLARITY. PORTABLE CONCRETE BARRIER SHALL BE TYPE 60K PER CALTRANS STD PLANS A63A AND A63B, OAE. INSTALL PER CALTRANS STD SPECIFICATION SECTIONS 83-1 AND 83-3, OAE.
 - ALL DIMENSIONS TO DRAINS ARE TO CENTER OF PIPES.

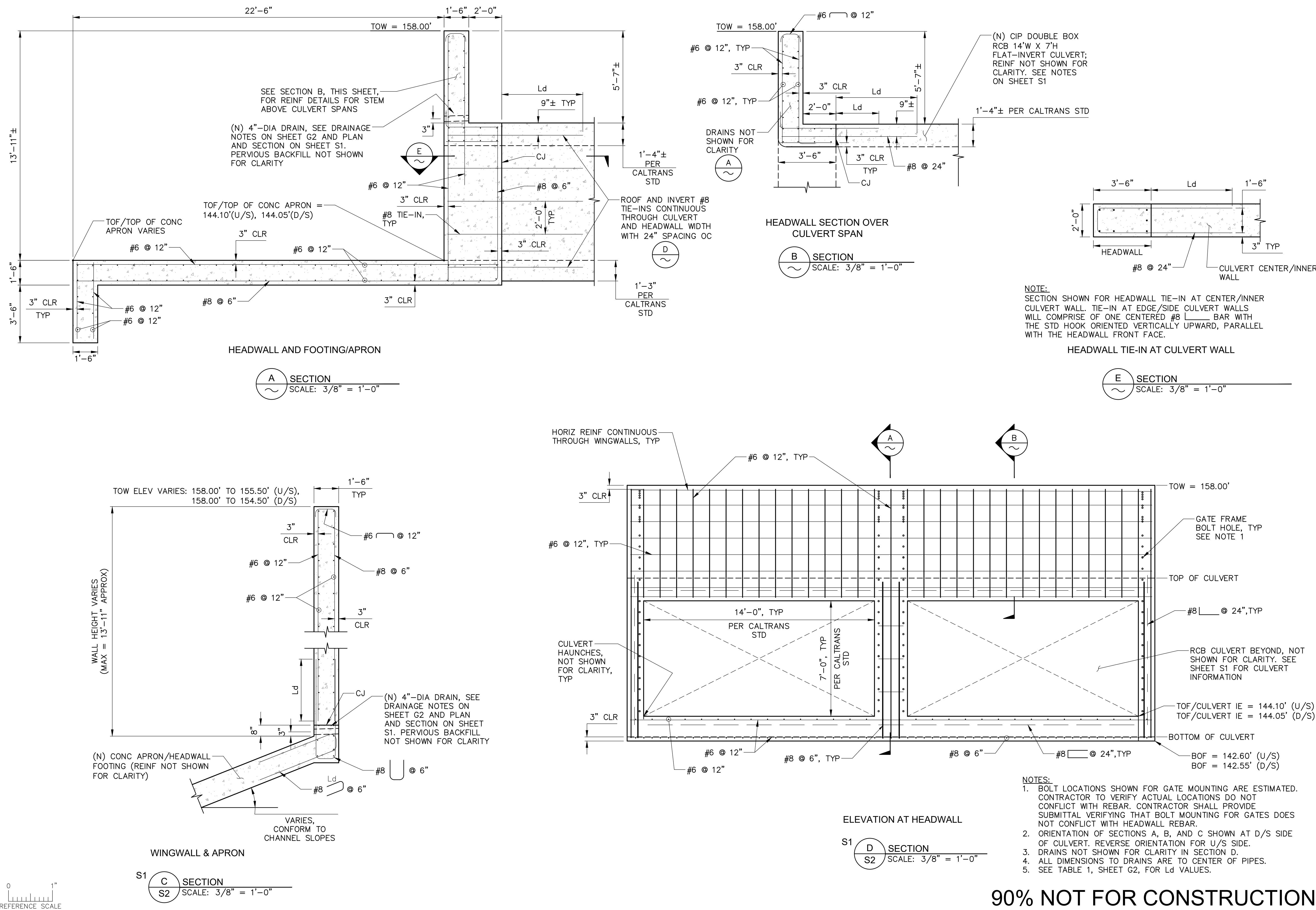


PLOT DATE: Monday, August 14, 2023 TIME: 6:34:02 PM BY: CONRAD, RYAN CTB: SAGE.CTB TAB: S1
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REV	BY	DATE	DESCRIPTION

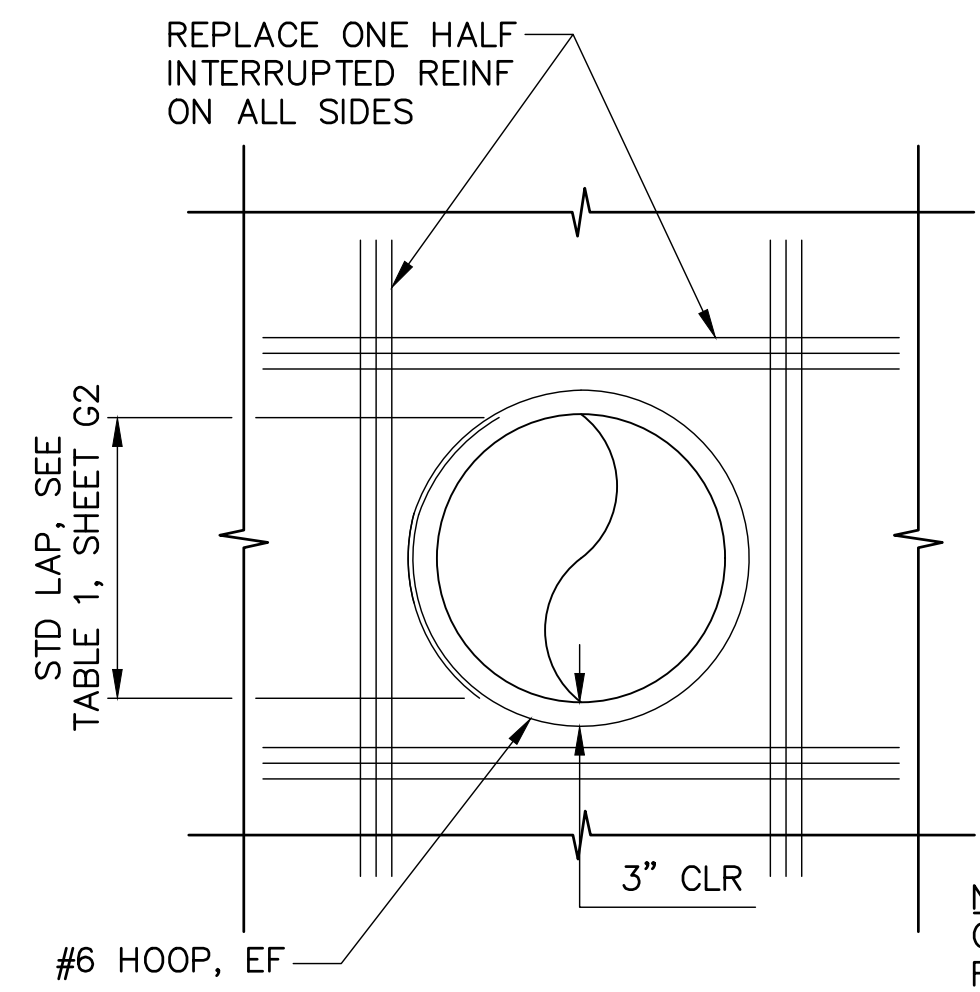
SECTIONS
 THREE BARREL CULVERT
 VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
 SANTA PAULA
 VENTURA COUNTY
 CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
 STATE OF CALIFORNIA
NOT FOR CONSTRUCTION

DATE: 08/14/23
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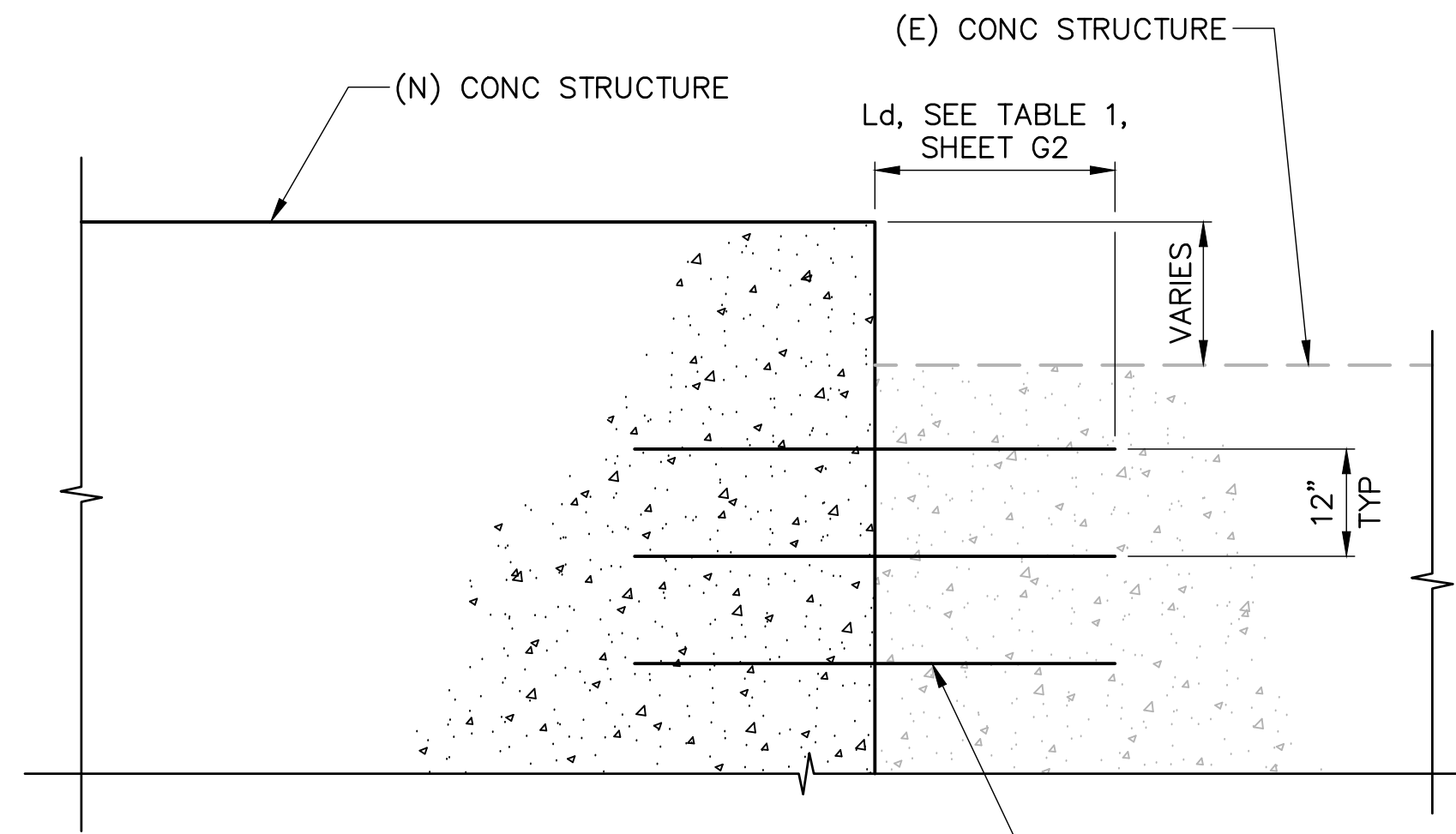
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HDPE PIPE PENETRATION

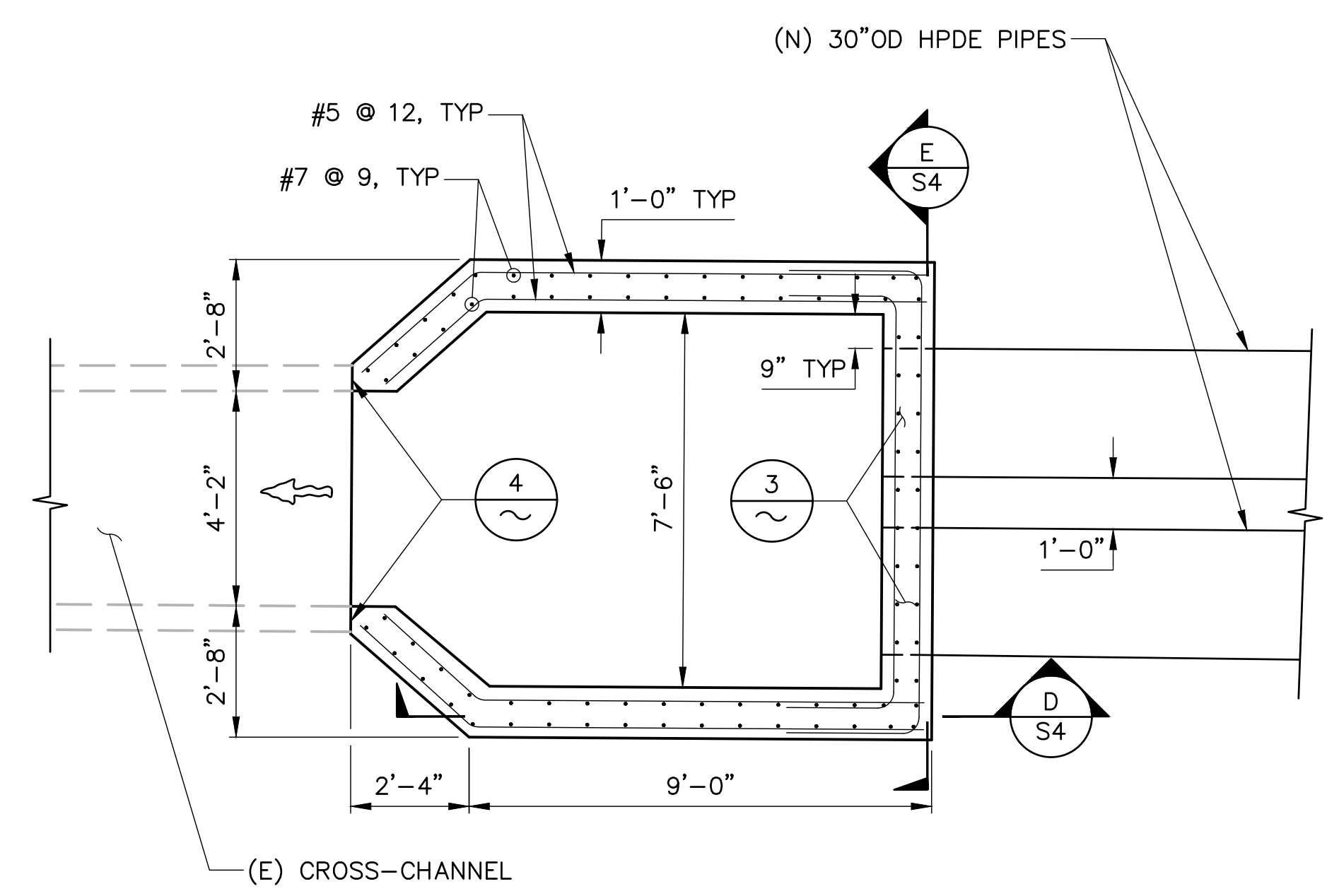
3 DETAIL
NOT TO SCALE

NOTE:
ONLY ADDITIONAL PENETRATION REINF SHOWN. TYPICAL REINF AND RUBBER MANHOLE STOP RING NOT SHOWN FOR CLARITY.



(N) CONCRETE TO (E) CONCRETE CONNECTION

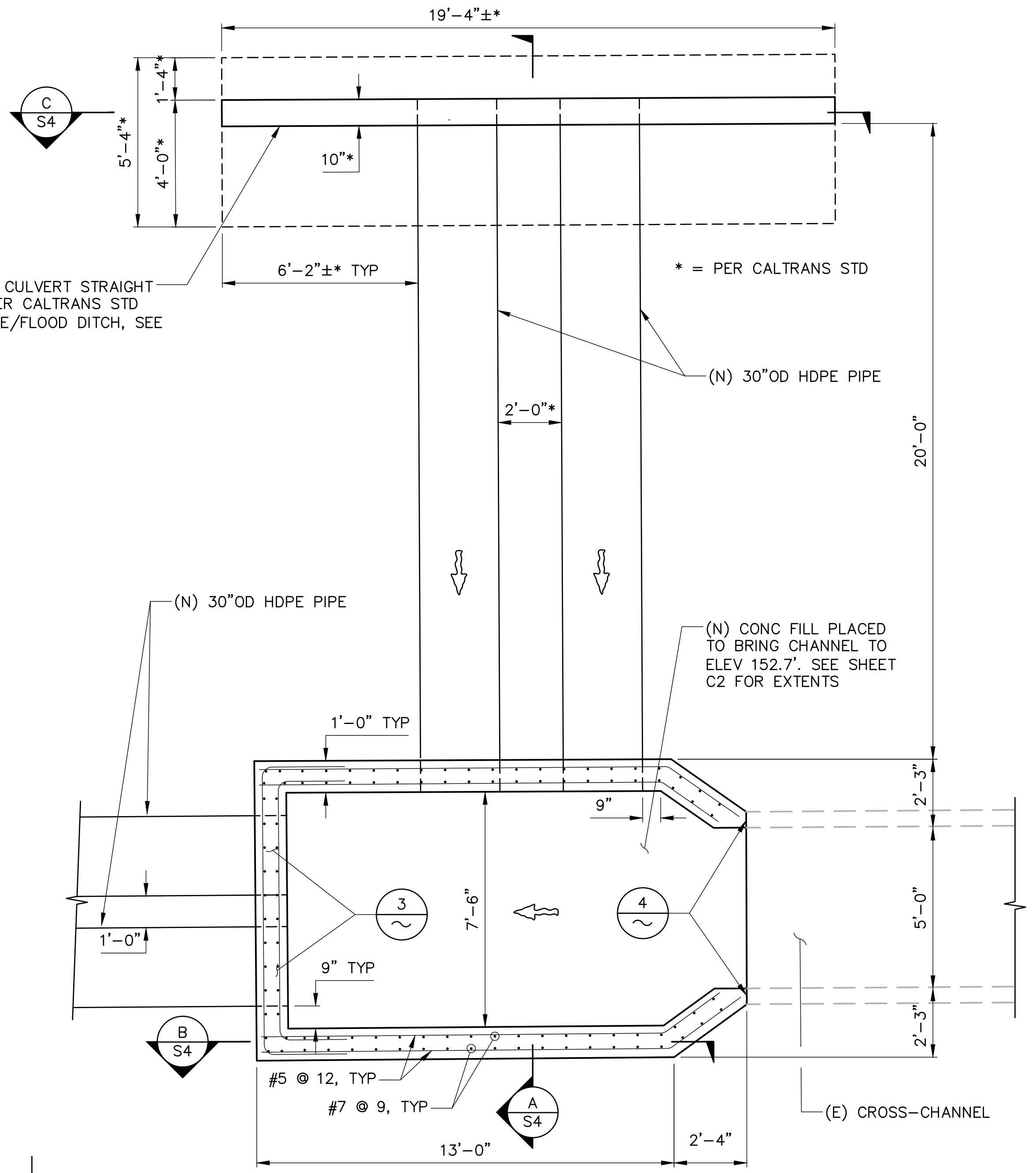
4 DETAIL
NOT TO SCALE



PARTIAL PLAN - CROSS CHANNEL OUTLET

1 DETAIL
SCALE: 3/8" = 1'-0"

(N) CIP PIPE CULVERT STRAIGHT HEADWALL PER CALTRANS STD FOR DRAINAGE/FLOOD DITCH, SEE SHEET S4



PARTIAL PLAN - CROSS CHANNEL INLET

2 DETAIL
SCALE: 3/8" = 1'-0"

REV	BY	DATE	DESCRIPTION

DETAILS
 THREE BARREL CULVERT
 VERN FREEMAN DIVERSION CONVEYANCE SYSTEM
 SANTA PAULA VENTURA COUNTY CALIFORNIA



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